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REPORT OF THE SECRETARY

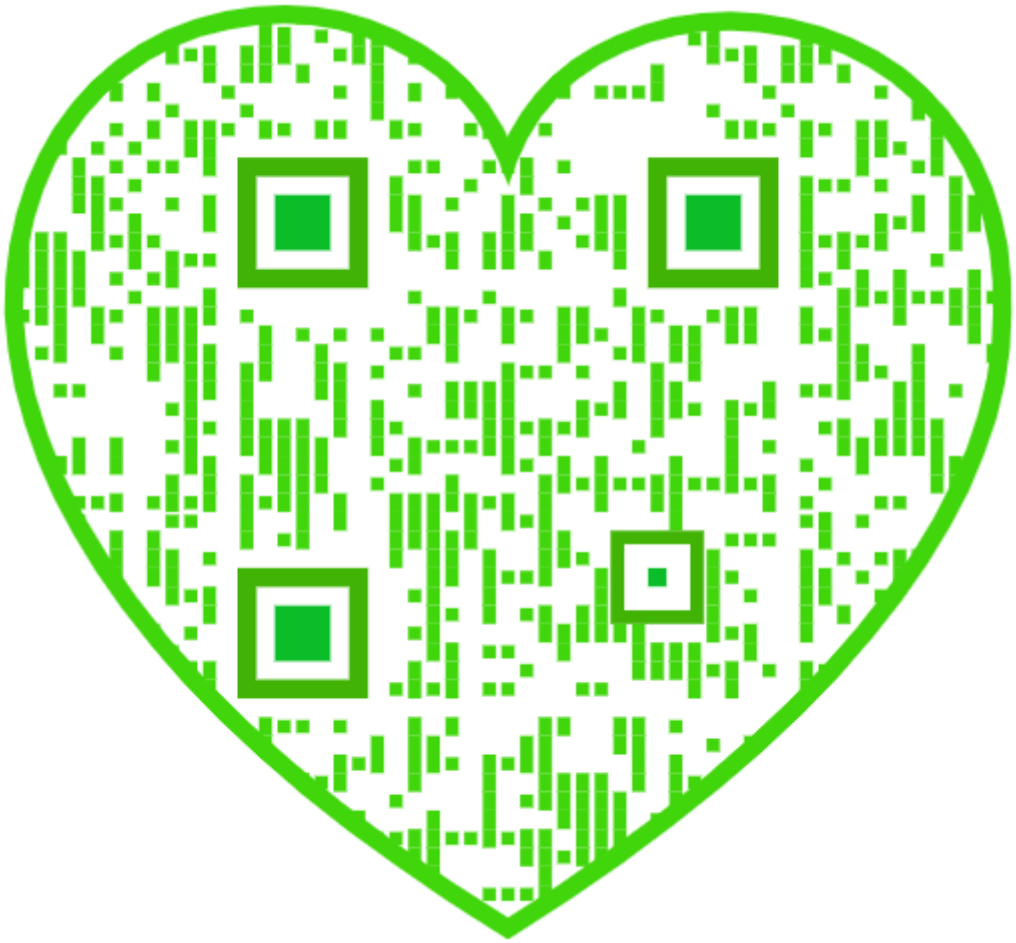
OF THE

Oregon State Board of Horticulture

ON

FORESTRY AND ARID LAND INTERESTS

REPRINTED BY THE AUTHOR
From a publication of the State of Oregon in 1898



A PAPER

ON

FORESTRY INTERESTS

OF OREGON

BY

JOHN MINTO

A REPRINT BY THE AUTHOR

SALEM, OREGON
ROSS E. MOORES & CO., PRINTERS
1909

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FORESTRY INTERESTS.

Mr. President and Members of the Board:

Since responding to your request in April last to write out my views on the subject of Forestry, I have, as you authorized, become a member of the American Forestry Association, and from its publications and others from the division of forestry of the United States department of agriculture, and from Hon. Binger Hermann, Commissioner of the General Land Office, I have secured valuable information on the present status of the national forest policy, in which the American Forestry Association seems to be an impelling and guiding influence.

The American Forestry Association is a voluntary body. Its membership roll contains six hundred and ninety names, sixty-eight being females; and three hundred and seventy-one—a clean majority—are residents of New York, Massachusetts, Pennsylvania, New Jersey, and the District of Columbia, fifty claiming residence in Washington City. It is, I believe, reasonable to suppose that the large majority of the members of this body are educated people—idealists on the subject of forestry. It is not deemed unreasonable to assume that the fifty members located in Washington are (in addition to being well informed) either in the employ of the National Government, or wishing to be so. The organization is so constituted that a few active members can shape the course of the association and become a powerful influence in framing the policy of the government relative to the disposal of forest lands. Take B. E. Fernow's position as illustration. He is chairman of its executive committee—three being a quorum; a member of its directors, four being a quorum. [And fifteen is a quorum of the association.] He is also chief of the division of forestry, which gives him a great personal influence. By the report of its executive committee, read by Mr. Fernow, February 5, 1897, we are informed that it *secured the appointment of a committee of the National Academy of Sciences "by inducing the then Secretary of the Interior* (Hon. Hoke Smith) *to ask the advice of that learned body"* as to the proper steps to be taken with reference to the public timber lands; that an appropriation of $25,000 was readily secured to pay its expenses; that "*it was not expected its recommendations would be*

essentially or strikingly different from those made and advocated by the association;" that it was hoped "the weight of the opinion of the eminent men of the committee, so secured, and the body from which the committee was selected—being the legally constituted advisor of the government in matters scientific—would do much to arouse more general public interest and to secure the passage of desired legislation." In the same report the committee mentions that "it passed and directed to congress and the executive, resolutions protesting against the modification of the Cascade range forest reserve, which modification the people of Oregon had petitioned for."

The report of the executive committee of the American Forestry Association was read at its meeting on February 5th. That of the committee whose appointment it secured from the Academy of Sciences, by the help of one or more competent clerks of the general land office detailed by Secretary Francis to assist in its preparation, had been "completed and submitted about February 1st." It recommended thirteen additional forest reserves, of an aggregate area of 21,370,784 acres. The recommendation was adopted and proclaimed on February 22, 1897, *without reference to the representatives of the states most directly interested or the conditions of their admission as political communities, in plain contravention of some important provisions.* The report is introduced by alluding to experiments now under process by Gustave Wex, an eminent engineer having charge of improvements on the river Danube, giving gauges recorded as to the high and low water marks of ten rivers having their sources in central Europe. As the examinations are incomplete, they are inconclusive as to central Europe, and constitute simply an introduction to the report, which seems to avoid scientific demonstration, to deal in assumption of facts and aspersions of industries in Oregon which cannot be truthfully applied to the natural conditions existing in this state nor to the actions of its citizens.

Happily, the report shows such a lack of statesmanship that it caused a halt in the movement of the policy which thus seems to have been initiated by the Forestry Association, the general objects of which are certainly worthy and very important where timber is needed. The wording of the report of the committee to the Academy of Sciences is such, as to assertions made and language used, as to create the suspicion that the committee trusted too much to the clerk or clerks the secretary of the interior placed to their assist-

ance. Assertions of fact are made and expressions used relative to sheep and sheep husbandry that may be passed over as emanating from an appointee of President Cleveland. It is not possible to believe such assertions and expressions to be the composition of any member of a body selected from the American Academy of Sciences, and the letter of Professor Sargent, in appendix *a* of the report, is *so superior* as to make it almost certain the members "signed a report none of them would have written." The tenure of the report is so abusive of sheep and sheep owners as to create the conviction that it is the product of personal animosity, as it is but a refined echo of the western cowboy's abuse of sheep and sheep owners—his successful contestants for grass in the range country. The effect of this part of the report will be to increase and encourage animosities which have caused the outrages against law and justice that have been committed against flock owners and their flocks in every range state. It is not intended to claim that sheep men are not sometimes aggressors in these troubles: they are not angels.

The use of the word "nomadic," as defining this mode of sheep-keeping, is calculated to give a false conception of the pursuit. The owners are not "nomads," nor are their flocks, indeed. The former have their settled homes in the dry pastoral regions of the range states—are themselves the equals of other men engaged in developing their localities, both in public spirit and private enterprise. This fact can be proved by looking at the development of a country much more closely resembling that claimed to have been examined by the committee than does that of central Europe—Australasia. But Australia, and the lessons to be derived from Australia's enterprise, in the conservation of scant water supply, its records of rainfall, its experiences of the encroachment of "pine scrub" upon sheep and cattle ranges, the greater success of the former on driest ranges as compared with the latter, has received no notice from this intelligent committee. Why? It would seem as though the work was already cut out for this respectable committee—as a stalking horse to the forestry association; and it came very near telling by whom, when it follows John Muir and B. E. Fernow in holding up to the secretary of the interior, and through him to the president of the United States, the examples of the imperial governments of Germany, Russia and British rule in India in regard to forestry; as though the citizenship of the United States were on the same level as the laboring populations of those countries, and there

were no agreement between the states and the nation in the way of its recommendations.

The committee commends the use of the army to guard these reserves, now aggregating nearly forty million acres, needed, as it claims, for the preservation of the water supply in the dry interior, and as a means of making money where the best timber is and water is not needed, as in the Olympic range in Washington. It recommends the exclusion of sheep from pasturage within these reservations, as destroyers of the forest and desolators of the plains. The herders are singled out as incendiaries of forests. The major reasons for its recommendations are that forests protect the sources of streams in mountain and highland districts, by preserving the snow from melting, and impeding the percolation of melted snow or rain from reaching the valleys below. My observation teaches me that mountains and highlands are the attracting causes of precipitation, and trees and brushwood are *effects* of this precipitation, that all other things being equal, snow melts first in belts of timber or brush, partly because the trees and brush break up the snow when falling and partly because of the influence of color on solar rays, dark objects absorbing, white, reflecting heat. The bulletin (No. 38) of the experiment station of the University of Missouri is now sending out the result of color on peach trees, showing that the simple act of whitewashing this sensitive tree delayed the swelling of the buds twenty-two days later than the unwhitened. This accords with my observations on the Cascade range, where it is rare to find a patch of snow within the timber after the middle of July, and not then near the trees or brush. Later than that snow is on open ground, generally where it has been laid by drifting. These snow banks on open land, and water from springs in valleys below, are the sources of rivers after the middle of July.

Congress, in passing the sundry civil expense bill, June 4, 1897, provided for the survey of the forest reserves, and empowered the president to revoke, modify or suspend all such executive orders or proclamations, or any part thereof, from time to time, as he shall deem best for the public interests; and suspended the proclamation of February 22, 1897, as to reserves in Wyoming, Utah, Montana, Washington, Idaho and South Dakota, till March 1, 1898. This action has had the result of causing the departments of the interior and of agriculture to send out special agents to collect information on the interests involved. Mr F. V. Coville, botanist of the department of agriculture, visited this office

with a letter of introduction from Hon. Binger Hermann, asking such aid as I could give him as a special agent of the department of agriculture, sent to Oregon with a view of studying and reporting upon the subject of sheep grazing within the forest reserves. I gave him all the aid I could and a general letter of introduction to such stockmen as he should meet on his proposed route northward from Klamath Falls on the summit and eastern slope of the Cascade range.

In a letter from Washington, acknowledging my letter was a service to him, he expresses the belief that he had gathered facts which would solve the grazing question.

A letter from Edwin F. Smith, statistical agent of the department of agriculture, asking the number of sheep and value of grazing on the Cascade range and foot-hills, was received by Hon. H. E. Dosch, of the first district, who turned it over to me for answer. Based on the number of sheep assessed in Wasco, Sherman, Crook, Lake and Klamath counties in 1896, and estimating the number of lambs not assessed, I count the total 707,667 head, the wool yield of which I estimate at 4,954,669 pounds, worth in the home market $495,366.90, all of which I credit to summer grazing, leaving the mutton and lambs to the credit of winter care; but I think the benefit of the sheep being taking off the plains in summer is worth fully as much to other stock interests—horses and cattle—and to the wintering of sheep, so that the total value would be in round number $1,000,000 annually. Only one-third of these sheep as yet go within the bounds of the reserves as laid, but the number is increasing as the flock-owners increase and improve their provisions for the winter keep. There is little or no lumber taken from the reservations. The provision for winter feed is the engrossing summer work of the east Oregon flock owner, and his success in that is the measure of his success in his pursuit. In this he has the advantage of the range cattle owner, as he has his flocks always under control, which is well nigh impossible with cattle or horses. Cattle, horses and fat sheep are generally shipped to markets east of the Rockies by rail, but sheep designed for sale as breeders for the ranges of Wyoming or the Dakotas, or feeders for the corn lands of Nebraska, Kansas, or adjoining states, are driven on foot, perferably on the highest lands on the route taken—both food and water and avoidance of local interests being considered. The Forestry committee, alluding to these interests, says:

"Great flocks are wintered in the sheltered canyons of Snake river, and then, spreading through eastern Oregon,

have destroyed the herbage of the valleys and threatened the forests on its mountain ranges. Sheep raised in eastern Oregon and Washington are driven every summer across Idaho and Wyoming to markets in Nebraska and Dakota, eating bare as they go and carrying ruin in their path. In every western state and territory nomadic sheep men are dreaded and despised. Year after year, however, they continue their depredations. The actual loss this industry inflicts on the country annually, in thousands of acres of burnt timber and in ruined pasture lands, is undoubtedly large, although insignificant in comparison with its effects on the future of mountain forests, the flow of streams and the agricultural possibilities of their valleys."

This extract contains the chief points of the committee's conclusions. The business of marketing sheep from west of the Rockies is in the hands of middle men, who pay for any accommodations they receive from residents of the country they cross. The picture of destruction is wholly imaginary, both as to the threatening of the forests and the ruin of pastures. I here insert an extract from a letter received from Commissioner Dosch, who has recently visited the Snake river canyons. He says:

"As you know, I have just returned from a trip to Montana and incidentally paid a visit to friends in Utah, Idaho, and Oregon, along the Snake river, examining many commercial and private orchards all under irrigation. I have come to the conclusion, notwithstanding the fearful heat, for it ranged from 108° to 111° in the shade to 133° in the sun in the orchards, agriculture and horticulture is much more satisfactory where one controls the water than to depend on the heavens for it, coming, as it does, at unseasonable times, which is not the case in irrigated districts. I have not seen finer kept orchards, nor more thrifty growing trees, nor laden with finer, larger peaches, pears, prunes and apples, than those very orchards along Snake river, which were but a few years ago barren wastes covered with sage brush and jackrabbits. The grain fields are simply immense, and as to alfalfa for hay it is beyond belief—three to four cuttings per year, averaging seven tons for the year. If our southern Oregon friends would take lessons from these Snake river people, they would simply have a paradise."

In a more recent letter Mr. Dosch tells me of one firm near Ontario who had 2,500 tons of alfalfa hay, who had just given an order for 2,000 calves to be purchased in the Willamette valley at $8.25 per head. Any reasonable business man knows that this transmontain trade in cattle and sheep is

one of advantage to breeder, middleman and feed-seller; and so far as the sheep are concerned they are not "hooded locusts" but the golden hoofed bearers of the golden fleece, eating a greater variety of the bitter weeds of the hot plain, and by their owners carrying gold to the owners of hay in the Snake river and other canyons, when their welfare demands such purchase. They do not eat coniferous trees at any stage of growth, and they *lessen* the danger of forest fires where they feed. This is the statement of unprejudiced men, from central California, to northern British Columbia on the Pacific coast. In the consular reports from Australia, which tell of sheep being destroyed in fires of dry grass and timber combined, there is not a single charge made against sheep keepers as incendiaries.

Among those who have been here this past summer to estimate the reasons for the people of Oregon desiring the reduction of the Cascade forest reserve, was Mr. B. E. Fernow, to whom allusions have been made. If his remarks relative to the Cascade reserve were correctly reported in the Oregonian of September 9th, it ought not to be hard to convince him the people of Oregon are right in their desire for its reduction. They, like the people of many other states, are very willing to have some of the most interesting mountains included in reserve parks. He ascended the bases of Mt. Hood and Mt. Jefferson and made an estimate of the reserves as a timber resource. To reach the latter mountain he passed through a community of a larger number of citizens than constitutes the American Forestry Association, whose families are supported by lumbering interests inside the reservation. He is reported as saying: "There is not much, although some, good marketable material on the Cascade and Bull Run reserves, but the larger part of the great reserve, I am inclined to think, comprises Alpine forest of hemlock and firs, which does not furnish material at present marketable, or else is burnt up. Although the reserved area appears large, its useful contents are but scanty. You may safely halve the area as far as serviceable timber is concerned." This is a remarkably good estimate of the eastern half of it, but Mr. F. was deceived as to the west half by seeing only the high ridge, whereon the timber is always thin and inferior from natural causes—foremost of which is lack of moisture at its roots; next, the injurious influence of the wind.

Mr. F. proceeds: "I have not heard a single good reason against the reserve. The reasons usually can be sifted down to some small speculative interest, that is supposedly

sacrificed to the greater communal interest. The poor man who has taken up a homestead in the woods—not to make a home, but to speculate with the timber on the 160 acres—feels injured because his speculation may not pan out; the sheep herder feels injured because he loses the free range to which he had hardly any right before, and which he did his best to destroy by his reckless manner of using it; a third class is formed by those who consider the reservation policy one imposed upon western communities by eastern cranks, ignorant of western conditions. These are to be pitied for their lack of perception that this is one country with one interest, knowing no east and no west." In this, Mr. Fernow charges bad faith and low motives to the "poor man;" selfish, reckless incendiarism against the sheep herder, and narrow, sectional jealousy against those who oppose the reserve policy. This is "one country," but there are supposed to be about seventy millions of personal interests covered by its constitution. There are some forty community interests legally formed, which should not be lightly infringed. The citizenship of the fourteen states and territories which have large amounts of public lands within their bounds, and of which they have heretofore been deemed the local guardians under the terms of their admission to the union, preserves a full average share of pride in the fact that this is a government "of the people, by the people, and for the people," which secures to the poorest citizen the ownership of himself, and may be said to invite him, by the homestead law, to the ownership of a home. As one of these, the writer claims the right to be heard in regard to this reserve policy, as it bears upon the interests and seems to threaten the liberties of citizens of Oregon, for reasons believed to be erroneously based.

With due respect for the members of the Forestry Association and the committee it secured to aid its objects, so far as these are to cultivate a public spirit to foster silvia culture where it is needed and to disseminate information to that end, I yet must from more than fifty years acquaintance with conditions in Oregon, half of which has been such as to make me familiar with the natural phenomena of the Cascade mountains and the effect of man's usage upon them, dissent almost in toto from the assumptions of the committee and the derogatory charges made against sheep, their herders or their owners. I owe to the nation to stand for the truth on this subject in all its phases, general as to forests and conservation of water supply, and particular as to sheep husbandry and its influence upon the growth of

conifers (the only forest trees of the Cascade range and interior mountains involved in this policy, except a little cottonwood and aspen.)

For two years prior to March 15, 1893, I was in the employ of the United States department of agriculture, to examine and report upon the conditions of sheep husbandry in the states of California, Oregon and Washington. The condensed report is published in the special report on the sheep industry of the United States, bureau of industry, 1892. Ten letters of California sheep growers are therein quoted, all protesting against the charges of setting out forest fires by sheep herders. They are samples of scores of letters of the same tenure, from which I gathered that, unless fires were started designedly by the *basque* herdsmen (who were really nomadic in their methods and had largely superseded the Americans in southern California) the charge was untrue against the sheep industry in that state. It never had a particle of truth in it as to the state of Oregon, so far as I know, nor in Washington. In British Columbia, the most recent government reports contain thirty-seven answers, giving causes of forest fires. Not one mentions the sheep industry as being the cause, yet there, as in western Washington and Oregon, the clearing of thinly set timber lands for homes, in which sheep can be utilized to some extent, is increasing as population increases.

Mr. Fernow is quoted as saying that the smoke he found an annoyance in Oregon will deter tourists from visiting this state. Well, Oregon as a community has not yet come down to the show business. The smoke is not the evidence of forest fires by incendiaries. It is in the main evidence of burnt offerings to nature's God by the home builders of western Oregon and Washington, who believe that:

> "To make a happy fireside clime
> For weans and wife,
> Is the true pathos, and sublime,
> Of human life."

Sometimes fires get beyond the control of homebuilders, though not often. Carelessness of summer vacationists, hunters, berry-pickers, travelers through unsettled mountain timber districts, and road makers, is the most common cause of forest fires. The Hon D. P. Thompson, who has had great experience in the timber lands of Oregon as a surveyor, believes he has knowledge of two instances where fires occurred spontaneously, probably by the rays of sunlight shining through clear turpentine exudations. This

may account for some fires on the east slopes of the Cascade range where the yellow pine exudes turpentine very freely. But it must not be forgotten that the Warm Springs Indian reserve is bounded on the west by the summit, and the Indians have the rights of hunting and grazing their ponies on the entire range, to which many of them resort every season, when (by custom from which they see no reason to desist) they renew the old berry patches and coarse grasses of the dry lake beds by fires.

I would estimate seventy five per cent. of the smoke obscuring the views of the September visitor in Oregon or Washington as the result of land-clearing for homes. The employment by the state of five or six active young men from the first of July to the last of October of each year would soon stop four-fifths of the fires resulting from carelessness west of the summit of the Cascade range. They are very rare now on the east side, and though ten years ago they were more frequent, they never were destructive of valuable timber, because the grasses, even when dried into hay, were always light within the timber belts. Pasturage of stock is a protection there, as fifty year's experience has proved that summer grazing prevents dry grass fires in western Oregon and Washington. If it were desirable to conserve the forest growth it could be done by selling the land, or leasing it, on defined conditions, as is done in the Australian colonies, where men of weight and influence are not in the habit of making war upon the most important industry possible in a country closely resembling these range states; wherein there are yet (although grants, reservations and private ownerships cover nearly all the water courses) exclusive of Texas, 531,000,000 acres of public lands, of which Oregon has 35,892,348 acres. Give the people of those dry plains the wise liberal inducements and security in their investments which have been made for sheep, cattle or horse breeding in Australia; and in addition to sheep husbandry already established, 100,000,000 acres of those dry pasture lands will become a field of production which will feed the looms of the nation, without the necessity of importing a pound of wool, and in addition will supply lamb and mutton to the people.

Senator Warren, of Wyoming, in a paper in The Illustrated American, estimates the numbers of livestock now feeding in the arid land states, and ranging chiefly on the public lands, as follows. Cattle, 14,000,000; sheep, 24,000,000; horses, 2,000,000, mules, 50,000. Under our existing land system, the contest for range privileges to which no man has an exclusive right

leads to rivalry and strife which not infrequently culminate in lawlessness and bloodshed. Give leases to applicants on nominal terms, or sell, under conditions, at very low rates, securing to those making permanent improvements in either case the appraised value of such improvements, whether on the plains, parched and dry, or on the grassy highlands, which are a haven of comfort for man and beast in the summer months. From all the range country at elevations producing the pine trees, timber and water will be carried to and conserved on the plains, and timber preserved on the mountains by local energies, guided and impelled by personal and local interests. Double the number of cattle, sheep and horses will be kept, and better kept than now; and lands now deemed not worth the purchase will furnish homes for thousands and tens of thousands of happy people —lands on which yet the wood growth is sage brush and the permanent live stock, jack-rabbits. The lease and conditional sale system in use in Australasia induced the change from loose herding to the Paddock system of keeping stock, and one-third more stock is better kept, and at less cost, it is claimed, on the same area of land than under the former method. What Australians can do, Americans can do.

In the national report on sheep, to which I have referred, will be found a letter of J. Parker Whitney, another kind of Boston man, who sent his brother to Australia in 1855 and bought 350 such sheep, at $50.00 per head. He succeeded in getting 120 of them to California, which he subsequently estimated as paying him $1,000,000. They induced him to buy 20,000 acres of the then cheap land in Placer county, California, which he was selling in small parcels in 1892 at $150 to $300 per acre, for peach orchards. This was near Rocklin, from which district he was the first man to send a train load of peaches east of the Rockies, and where I saw the Central Pacific railroad company, and private parties clearing lands of the pine and other scrub which had grown up on closely grazed lands within the past twenty-five years, just as it has done in Western Oregon.

The estimated area of forest land in Oregon has been considered at about 16,000,000 acres in the entire state. Dr. J. R. Cardwell, Commissioner at large of the State Board of Horticulture, considering the economical values of the coniferous growth of commercial value, estimated it at 16,000 square miles, or 10,000,000 acres, in 1893. This estimate Mr. A. W. Hammond, of Wimer, Oregon, vice-president of the American Forestry Association, adopted in his report to that body in 1895. He puts "the merchantable timber on the

latter area at 400,000,000,000 feet, board measure." I learned from the Oregonian, that Mr. Hammond, was the first to publish these estimates. He says: "The annual out-put is now estimated at about 200,000,000 feet; but even this amount must be insignificant in comparison with the amount annually decaying and in a sense going to waste in the forests through natural causes. In many places, even about the settlements, one will see numbers of the very largest and handsomest pine trees, in every respect magnificent specimens, 200 to 250 years old and more, dead and dying, that must go to waste because of the entire absence of means of converting them into lumber.

"The annual out-put, in fact, represents an amount equal to about 10 per cent only of the annual growth. Whence it follows (if the forest remains stationary) that an amount equal to 90 per cent of this new growth is annually going to waste. This means, in other words, that if the mature timber could be culled annually from the forests of this state, they could be made to yield annually about 2,000,000,000 feet, board measurement, without detriment."

I quote a little farther from Mr. Hammond to show how impractical a good man can be. He says: "In the opinion of the writer, what is most needed here just now is, *first*, some efficient regulation in regard to forest fires; *second*, proper measures to prevent the gobbling up of large tracts of the most valuable portions of forests by private corporations where lumbering operations are liable to be carried on without reference to future needs or to future conditions of the country. The general sentiment here is yet far from being sufficiently alive on this important subject. So many interests would like to share in the general prosperity that that would follow the working on any adequate scale of the great forests of this state, that public sentiment, it is only too well feared, would be in sympathy with any movement of that kind, and the future needs or the future condition of the country would receive no attention except at the hands of a few."

How restful the mental condition of a man must be who can contemplate 1,800,000,000 feet of lumber wasting annually for lack of users, yet let the waste (which is one hundred fold more than annual destruction by forest fires) go on for fear of over-cutting in a country like this. The writer greatly prefers to meet present human interests, and is very glad to believe the people of Oregon are of the same mind in very large majority. They are proving this by the very great

increase in the lumber cut since Mr. Hammond wrote down his estimates and his fears.

The enterprise of the managers of the Oregonian has given us the lumber cut of 1897. Believing they will be interesting reading to ideal foresters and friends of forestry for its uses to humanity, I insert two papers relative to the subject from the Daily Oregonian of January 1, 1898.

LUMBER CUT.

"The saw mills of Oregon cut 519,823,179 feet of lumber last year. By counties the cut was:

Baker	$ 30,000,000
Benton	1,100,000
Clackamas	4,000,000
Clatsop	28,000,000
Columbia	18,176,000
Coos	22,000,000
Crook	1,500,000
Curry	100,000
Douglas	35,000,000
Gilliam	1,000,000
Grant	100,000
Harney	2,000,000
Jackson	27,500,000
Josephine	15,000,000
Klamath	22,000,000
Lake	900,000
Lane	15,000,000
Lincoln	2,000,000
Linn	20,000,000
Malheur	500,000
Marion	2,455,000
Morrow	850,000
Multnomah	130,000,000
Polk	7,445,870
Sherman	
Tillamook	22,000,000
Umatilla	100,000
Union	24,500,000
Wallowa	926,000
Wasco	2,500,000
Washington	12,000,000
Yamhill	600,000

"The mills of Multnomah county cut 130,000,000 feet, valued at $1,040,000, an average of $8 per thousand. The same average applied to other counties, brings the value of the cut in the state to $4,398,585.13.

"Oregon's timber supply is practically inexhaustible. The great belt, comprising the counties of Clatsop, Columbia, Washington and Tillamook, contains, as is set forth in another part of this paper, approximately 56,000,000,000 feet of standing timber. Last year the lumber cut in the four

counties just named was about 80,156,000 feet. At that rate it will take nearly 700 years to exhaust the standing timber in the belt.

"Multnomah county cuts more lumber than any other country on the Pacific coast. Portland cuts more lumber than any other city on the Pacific coast. She leads the Pacific northwest in lumber as she leads it in every other commodity. As Portland is situated close to the world's greatest timber belt, there is no likelihood that she ever will lose her position as the greatest lumber-manufacturing city on the Pacific coast. Development of the great belt, which must take place within the next ten years, will make Portland the greatest lumber-manufacturing city in the world."

THE WORLD'S GREATEST TIMBER BELT.

(Oregonian, January 1, 1898.)

The greatest timber belt in the world is in the counties of Clatsop, Washington, Columbia and Tillamook, in Northwestern Oregon. In the four counties there are 1,884,960 acres, containing 56,149,200,000 feet of timber. The standing timber is worth on the average 50 cents per 1000 feet, board measure, or $28,074,600. Manufactured into rough lumber, it is worth, at the rate of $7 per 1000, the enormous sum of $393,017,400.

Clatsop county has about 530,000 acres of timber land, averaging 35,000 feet per acre, making a total of 18,550,000,000 feet.

Tillamook county has about 700,000 acres, which will average 35,000 feet to the acre, making a total of 24,500,000,000 feet.

Washington county has about 264,960 acres, which will average 20,000 feet to the acre, making a total of 5,299,200,000 feet.

Columbia county has about 390,000 acres, which will average 20,000 feet to the acre, making a total of 7,800,000,000 feet.

The foregoing totals of 1,884,960 acres of timber land and 56,149,200,000 feet of standing timber are conservative. The majority of people who figure on Oregon's available timber supply base their calculations on an average of 40,000 feet per acre. The average value of 50 cents per 1,000 feet for standing timber is reasonable. Present prices of stumpage in the Oregon timber belt is from 50 cents to $1 per 1,000. Government forestry experts have placed the average for Oregon at 62 cents per 1,000 feet.

The principal rivers in the timber belt are the Nehalem, the Wilson, and the Trask. Along the Nehalem are 570,300 acres, averaging 40,000 feet, making a total of 22,812,000,000

feet. Along the Wilson are 111,640 acres averaging 35,000 feet, making a total of 3,907,400,000 feet. Along the Trask are 102,400 acres, averaging 40,000 feet, making a total of 3,584,000,000 feet.

The timber in the belt consists of fir, cedar, hemlock, spruce and larch. The fir is the genuine yellow or Douglas fir. It constitutes 8 per cent. of the entire growth. Timber in the belt is less subject to fire than timber in any section in Oregon. This is because the lands slope toward the ocean, and the heavy fogs which prevail in the summer keep the leaves and underbrush so damp that fires cannot take hold.

Michigan and Wisconsin lumbermen of large capital own immense bodies of timber land in the belt.

This showing of forest wealth in the five counties in the northwest corner of the state of Oregon will be agreeable reading for her citizens, and a study of the question of natural supply of the entire state will lead to endorsement of the words of the Oregonian that it is "practically inexhaustible" if our fellow citizens of the American Forestry Association can be persuaded to refrain from such methods of procuring legislation affecting their fellow citizens on this side of the continent—the conditions of whom they cannot understand sufficiently to justify their meddling, by open action or secret intrigue, obstructive of the most economical mode of harvesting this great source of natural wealth. Information derived from the assessor of Clatsop county enables me to confirm the statement of the Oregonian, that "Michigan and Wisconsin lumber firms of large capital own immense bodies of timber in this belt. But these companies are not operating the large and costly harvesting agencies in their own timber. Why? Because the Wilson bill gave the lumber market of the world to Canada, and the wool market of the world to Australia, and these men of Michigan and Wisconsin were compelled either to let their machinery rust in idleness or set it up near the line of the Canadian railway, and it has been employed there during the past four years, while the waste of decay has been going on in the woods of Oregon. On the other hand, the development of Oregon's portion of the great inland empire has been obstructed by the policy alluded to and the insidious methods of the American Forestry Association, as I have shown.

The *Oregonian's* tables show the lumber cut of the five northwestern counties of the state to be 210,176,000 feet; that of the five grazing counties of Crook, Grant, Harney, Lake,

and Malheur, 5,300,000 feet. The nation has given about 2,400,000 acres of the public lands to induce the construction of so-called military roads into these counties. Thirty-seven years ago families of the pioneer class of citizen (whose early settlement of Oregon and Washington gave the nation its most important title of occupancy to half of the then Oregon territory) began to settle within the boundary of these five counties, making investments in full faith that the liberal policy which had caused the construction of these roads would be continued, and the country be developed. There they have lived. Their families have increased, but many of the younger generation, on coming to maturity, have left the isolation of the pastoral life behind them, and have left many remaining who would follow their example if they could find purchasers for their properties. They have endured the hardships that attend the occupation of raising cattle, horses, and sheep in that region, and the dangers inseparable from the contiguity of the native race. There is no longer necessity for the military roads by which to give succor there against Indian uprisings. The projected Oregon Central and Eastern Railway (the construction of which began on a financial basis furnished by two military road grants) is impeded by the Cascade forest reserve. This road, if completed to the east line of the state, would answer more than all the purposes of the military roads for national uses; as troops hereafter will be collected in these range states of the interior and brought to the Pacific shores, where the emergencies demanding military power are most likely to arise. Meanwhile the most important aid to an increase of homes in the central part of the state of Oregon, and eastward and southward of that region, as a railroad through that country, so that lumber for homes and fencing material, and for irrigation projects, can be distributed with greatest economy. In the valley and pass by which this line of railroad is now more than half way across the Cascade range there are more than one hundred resident homesteaders who were located within the limits of the forest reserve before it was proclaimed. Many of them were stopped in their efforts for improvement and development of their homes by the prospect of an unendurable isolation, the proclamation in effect destroying all hope of the social surroundings which are the best influences of civilization. To open that reservation, two townships wide, to free acquirement of the land, under any reasonable conditions as to harvesting of the timber, would be the best possible encouragement to those interested in this railroad enterprise which

this forest policy has so far stopped. It would encourage the completion of the road, the manufacture of lumber through a fine timber belt eighty miles wide, and give healthful home-supporting opportunity to at least five thousand heads of families; furnish lumber freights, both eastward and westward, to the railroad line, and develop the numerous interests in connection with this comparatively small opening, for which many people have been waiting for more than twenty-five years.

If the writer were desirous of suggesting the very best means within his knowledge of lessening the dangers of the most extensive and destructive fires possible in the Cascade timber belt, this is the recommendation we would make: Clear a gap across the range in the quickest and most judicious way possible. The committee on forestry recorded one undoubted truth: "No human agency can stop a western (Oregon) forest fire after it has once obtained real headway, until it encounters a natural barrier, is extinguished by rain, or expires for lack of material." The opening of this gap is suggested as means of creating an artificial break in the consumable material, and an interested resident population of guards, *which can be made subjects of legal call for aid as one condition of conveyance of forest lands from the nation or the state.*

Another reason for the foregoing suggestion is the value of the water power now running unused. For fifty-one miles the North Santiam river, running down this valley, has an average and very uniform fall of fifty-one and one-half feet per mile. It is questionable whether there is another stream in the state which could be so often and so cheaply used in the production of force. The very refuse of its forest wealth could be ground into paper pulp by water-driven machinery. The writer is no machinist, and knows little of what can now be done with electric force, but sincerely believes that in this valley there are great opportunities for its cheap manufacture and a convenient field for its use in harvesting the timber growth which ought to be here saved from further waste, and as a guard against possible destructive forest fires. There is also, near the head of this valley, a very inviting field for fruit growing, dairy farming and apiaries. Twenty years ago it was estimated there was room for the settlement of 2,000 families on open or partially open lands, upon which seedling timber has since much encroached.

In view of this great waste going on in the forests of Oregon generally, in view of the situations described as to for-

est and arid lands near the center of the State, is there any reason for the people of other states to interfere with the people of Oregon harvesting their timber wealth in their own way, under such circumstances? Ah! but these Eastern friends say "We look to the future and the oneness of our country." The Western citizens will say: "Yes, but the oneness will be best maintained by each expending his public spirit where he knows the condition." Let the citizens of New York continue to enlarge the state's holdings on the Adirondacks. Let those in Massachusetts use the abandoned farms in that state for public timber lots. Let those of New Hampshire follow the example of Mr. Austin Corbin, who has shown to the world a field of interesting study by collecting 1,000 elk, 150 moose, 1,200 deer, and 85 buffalo, and an indefinite number of wild swine, all in a forest park of 26,000 acres, to form which he canceled 375 titles, by purchase at from $1 to $25 per acre, from people who, we may suppose, find life more pleasant in manufactures or trade of town or city, or in the pulse-stirring home-building of the West, to which they are always welcome. In every state there are openings for the public spirited idealist, or if he does not wish to share his plans with others, there is the fine example of the founder of Biltmore—an investment in 100,000 acres of southern pine forests, to be managed for its forestry products. There are openings for others in like enterprises in the New England states.

EFFECTS OF FOREST GROWTH ON WATER SUPPLY.

It is not possible for men and women who never saw the effect of irrigation to estimate its value under such conditions as Mr. Dosch describes in the canyons of Snake river, and Dr. Fernow bears witness to having seen on the deserts of Arizona (during his examinations of the forests of that territory, recently published by the American Forestry Association.)

Dr. Fernow notes that "The broad valley of the Rio Verde, which carries the drainage from the plateau of Salt river, is capable of agricultural development to a much greater extent than has been attempted, but, as in other parts of the territory, this requires systematic storage and utilization of water. By careful management, the cattle, sheep and goat industry would, no doubt, be able to use advantageously the large non-irrigable areas." This suggestion can be truthfully applied to the whole arid land country from the Mexican line to British America, and from the summit of the Cascade range in Oregon, to Western Kansas and Nebraska.

The present flocks and herds, said to number 24,000,000 of sheep and 1,200,000 cattle, in the arid land area could be greatly augmented, and an amount of additional value gathered from what is now desert that can hardly be conceived of. It is greatly to be hoped that the departments of Government will take measures to aid its present development, instead of creating and guarding solitudes. It is more than twelve years now, since the writer suggested the use of means to get artisian water onto these arid lands.

On similar areas the governments of Australia are in advance of ours, both in the reservation of forests and provisions for and conservation of water supply. In New South Wales alone, the number of reserves aggregates 15,050, distributed over every county and almost every parish in the province, in order to meet the needs of the people, ranging from 15 acres to 74,000 acres in area. Some of them are along the banks of rivers, extending two chains from the bank, apparently as protection from the flood, wood and debris carried by the streams when in extraordinary flood, as sometimes occurs there as in some portions of arid America. They are under a local board of control, which tends to cultivate a public spirit—though sometimes so numerous as to create confusion. The report mentions thirty miles on one river as being in charge of no less than fourteen boards. There is no hint in the consular reports of the practical Australians creating permanent reserves of millions of acres of timber as protection to the flow of streams. The whole system seems to be managed for immediate practical development, such as is greatly needed throughout our arid land districts, in which there are now settlers who have to use sagebrush for fuel. From the report of Consul Cameron, of Sydney, New South Wales, the following is taken "It is worthy of note, the influence of trees is comparatively 'nil' in this country. During the exceptionally wet year of 1887, on Dinby station, north of Baradine, 408 miles north of Sydney, situated in a densely timbered country, the mean rainfall was 32.66 inches against 38.92 at the neighboring station in the open. On the other hand, in the very dry year of 1888, Dinby figured for 11.73 inches with 15.52 inches at the above stations. Elevation, however, seems to have a beneficial influence on rainfall, as the average of fourteen years at Wollongong, half a mile from the sea, at a height of sixty-seven feet is 38.84 inches, and at Cordeaux, near the same place, six miles from the sea, it is 55.53 inches for seventeen years at an elevation of about 1,200 feet." The foregoing extract is given for what it may be worth as indicating whether it

is the presence of the timber which influence precipitation, or elevation, merely, which has a favorable effect in increasing rainfall. There are other points in Consul Cameron's excellent report that I shall call attention to, namely, the amount of moisture taken up by evaporation by different soils and situations, but more particularly the difference between sod-covered soil and bare earth and water surface. The test was made by Mr. H. C. Russell, B. A. C. M. G. F. R. S., the government astronomer for New South Wales. The tests were secured by the use of pans eight inches deep, and surfaces of four square feet and the records made when practicable through the twelve months of the wettest season recorded, which showed a mean temperature of 63.1°, the total rainfall was 81.418 inches in one hundred and eighty four days of the year, on many of which evaporation did not take place, the water running over the test pans. The total evaporation from the square in grasses was 35.960 inches; from the water surface 31.027 inches; from the garden soil, which, though sandy, hardened when dry, it was 25.476 inches, showing, by a difference of nearly ten and a half inches, that either the inherent heat of the live grass, the increase of exposed surface by the grass blades, or the sponge-like absorption of the bare earth, made this difference. It is probable all three agencies were operative, but there is a difference between the grass and the water surfaces. The grass giving off 4.933 inches more than water. This indicates an effect of absorption of heat by the broken surface and color of the grass, and perhaps a reflection of heat from the surface of the water, an effect I claim as one reason why a solid snowbank will lie longer in the open air unmelted than in thick timber or brush near by, an effect that every one familiar with the mountains can often see. Other influences are present, namely it is warmer in dense timber in the winter season than in the open and while it is cooler in the timber during the daylight in summer when the sun is shinning, it is warmer within a timber belt on a summer night than in the open. This is proven by the fact that cold given off from the bodies of snow during the night in the summer months often causes water to freeze in the open, when it does not do so in the nearby timber. There is another and very important fact indicated by the difference of ten and a half inches of water evaporation between the grass covered and the bare soil, during the days of one year on which evaporation took place. If the great evaporation was caused by the life and color of the grass and the increased surface its blades offered to the sun's rays we may reason-

ably expect the greatly increased surface of a growing forest will throw off a greater amount of moisture by evaporation than will a grass surface. The question whether this is so or not is most respectfully referred to the eminent body of scientists to which the forestry committee belongs, and to the national experiment stations generally. The writer believes science will find that trees not only extract water from a greater depth of earth than does grass, but also give off during the growing season much more. The evaporation, we see by this table, was nearly thirty-six inches of 81.48 that fell. Could experiment be brought to the solution of the question, the prediction is ventured that it will prove that trees not only draw much more water from the soil than grass but that, drawing it from a greater depth of cooler earth, they scatter a greater coolness from their leaves, and thus produce the grateful shade and pine-scented breath of the forests we all delight in.

Leaving this subject for the present, I quote again from the consul's report immediately following the tables I have summarized. He says: "In addition to my previous remarks descriptive of the soil characteristics, it should be borne in mind that every fleece of wool that is produced takes a percentage of potash and other fertile matter out of the soil, and that hitherto nothing has been done to replace these elements. As a consequence, valuable herbage gradually gives out and is replaced by an inferior output. For instance, *pine scrub has seized on thousands of acres in the interior of what was formerly magnificent pastoral land.*" The italics are mine. I don't believe Mr. Cameron has got the true cause, though it may be so in some thin soils in Australia. Pine scrub and that of yellow fir (Douglas spruce) takes the land in eastern and western Oregon where a fleece of wool or a pound of flesh never was extracted from the soil by domestic animals.

The consular report from which I have just quoted contains much that may be useful to the industries of eastern Oregon, which is the western edge of vast natural pasture lands of the range states, and of which Oregon yet has nearly thirty millions of acres east of the Cascade range, which, as yet, are neither reserved nor sold. For the certain development of these lands to the highest possible use, both timber and water conservation are necessary under conditions which seem so nearly similar to those in New South Wales as to make the examples they set us in their methods of great value, as guides towards improving our own present methods. The report shows that the natural condition of

each district has been closely studied as to the kind of stock it will best support. Heavy or light horses, heavy or light cattle, cattle for the dairy, or cattle-breeding for beef—the districts better adapted to sheep than any of the larger stock,—these eminently practical people have consulted the *genius of each locality* and devoted the land to the purpose for which nature best fits it. It also shows that not only private enterprise, but public money is actively at work developing the best means of getting water onto the arid areas of that land, once thought impossible of use to civilization, as was the Great American desert of fifty years ago. In doing this the example set by private enterprise in California in sinking artesian wells, is not only encouraged by public recognition, but the government engages in the same business when private capital and enterprise are insufficient, doing such work as was suggested by the writer in a letter to Governor Moody and by him forwarded to Senator J. N. Dolph, and by him submitted to the appropriate committee of the United States senate. The committee included in an appropriation bill a liberal item to test the artesian well system in Colorado and in Oregon, which was defeated, I think by nonconcurrence of the house of congress.

The need of water on the vast body of the public domain yet in the arid land states requires that means should be taken to approximately measure the amount of water which does not flow off by the river system, nor is yet accounted for by the ascertained evaporation. In this, common observation teaches that people of eastern Oregon are very greatly interested, because, on account of the character of the surface formation, the precipitation falling east of the summit ridge of the Cascade range seems in larger measure to pass into the ground where it falls—and not on that range and interior mountains merely, but over the great plain of the Columbia basin. The disappearance of snow from the surface, under the influence of the (Chinook) wind from the Pacific ocean, leaving the ground dry in a few minutes, seems to the observer magical turning in a few hours of time the extensive arid lands of Oregon, Washington, Idaho, and western Montana from a snow covered condition distressful for the stock owner to contemplate, into immediately usable pasture lands, yet showing little effect on the great river of the west—the Columbia the floods of which occur usually in June.

Where does this precipitation lodge; and is it recoverable for uses in agriculture and horticulture? are questions of more pressing importance to the people of Oregon at present

than the opening of the unnecessarily large Cascade forest reserve, on the eastern portion of which, pasturage being permitted, the livestock interest can have the benefit until a permanent forest policy (should one be needed) can be adopted, which will minister to the general welfare. I have endeavored to show that the privilege of grazing the east side of the Cascade range and foothills is of the annual value of $1,000,000. The entire value of the sheep and wool interest of the state is shown in the *Oregonian* of January 1, 1898, to be as follows:—

Sheep, 2,167,241 head at $2.25	$ 4,876,292 25
Wool, 15,706,356 pounds, at 10 cents	1,570,635 60
Total for sheep and wool	$ 6,446,927 85

Nearly, or quite, four-fifths of the value is in the 1,867,512 sheep kept in the fourteen counties of Eastern Oregon, where, as I have said precipitation sinks below the surface in a manner our eastern friends, who pass resolutions to keep the use of our forest lands from us, cannot possibly understand. Could these gentlemen become imbued with the knowledge Dr. Fernow gained by his visit to Arizona last fall, and perceive as he did the wonderful effects of water on the arid lands, which by the use of irrigation water will become fields of production—gardens like that of Eden in which to grow "every tree that is pleasant to the sight and good for food," they would cease to injure us. To realize Mr. Fernow's conception there is much more necessity for the expenditure of public money, to indicate to the people how to secure the water precipitated during the year, for use in the growing season, than there is for a forestry policy, albeit the experiment station of Utah, by acting on Dr. Fernow's proposition for setting apart certain lands for testing the timber trees, suggested by him in order to find what is best, is taking hold of the forestry question in a practical manner. The experiment station's efforts to find how much irrigation water is required for the production of a given crop is very commendable, as teaching how to make the desert blossom with the rose, in the very midst of the vast area, we now begin to see of value that cannot yet be estimated; but which I believe will be increased, not diminished, by the use of sheep in pasturing all the timbered highlands interior to the Cascade range, as well as on its eastern slopes.

To close this paper, I will summarize the position I believe the closest possible scientific tests will demonstrate as true,

First.—Neither in the valleys nor on the mountains of Oregon are either sheep or cattle an injury to the growth of coniferous trees.

Second.—While the density of the forest growth which Oregon people deem commercial timber makes sheep keeping in it impossible, the grazing of the summit ridges and eastern slopes is beneficial and protective.

Third.—Snow melts first on those mountains within the timber, or on brush lands, to which I add, both timber and brush lands consume more water than they give out (none of which is given out in any other way than from the leaves.) Trees lift the moisture from the earth while growing; the common observation of all who have worked in maple-sugar camps teaches that there is a principle of life in a tree that causes the sap to run when the grass plants are under snow. Still, snow lying from winter till after the middle of July is incompatible with the growth of timber of value. The surface sources of streams are from snow in the open after that date. To this I will add that no plant known to me dispenses water from its roots—all are drinkers; and when the question becomes so important as it is now becoming—how to make homes of abundance on the yet unpurchased arid lands, it is better to find out, if it be findable by science, whether we have not all been following "a general concensus of opinion" which science will not sustain, by believing that shade will increase the flow of a mountain stream as we were taught by the charming Ayrshire plowman, when he made the stream say:—

"Last day I grat wi' spite and teen
When Poet Burns cam by
That to a bard I should be seen
With half my channel dry."

The conception of the poet was that the trees by their shade would prevent evaporation of more moisture than there roots would take up. The forestry committee reasons on that basis, but my observation compels me to conclude that the Shepherd King of Israel was truer to nature than Burns, and will be found truer to science when he said of a good man: "He shall be like a tree planted by rivers of water that bringeth forth his fruit in his season; his leaf also shall not wither" * * *—Psalms 1:3.

APPENDIX.

In order to bring before the mind of interested readers the ratio of evaporation, table No. IV of bulletin 50 of the Utah

experiment station is inserted as showing the results obtained by two European scientists:

TABLE NO. IV.

Made by Hellriegel		*Made by Wollny*	
Crop	Ratio of water evaporated to weight of crop harvested	*Crop*	Ratio of water evaporated to weight of crop harvested
Horse beans	262	Maize	233
Peas	292	Millet	416
Barley	310	Peas	447
Clover	330	Sunflower	490
Spring wheat	359	Buckwheat	646
Buckwheat	371	Oats	665
Lupine	373	Barley	774
Spring rye	377	Mustard	843
Oats	402	Rape	912

According to Hellriegel, 330 tons of water would be absorbed by the roots of clover, drawn up through the stems and evaporated from the breathing pores of the leaves for each ton of clover harvested. If the yield be estimated at three tons per acre, the quantity of water per acre is 990 tons, or a volume sufficient to cover the surface to a depth of 8-11 feet, or nearly nine inches.

Hellreigel's results as to clover tends to explain why alfalfa, one of the strongest growing of the clover family, is "always dry," not unusually receiving sufficient over the surface during the growing season in Utah to cover the ground six feet. Should alfalfa be found to drink water by the roots in the same proportion as above claimed for clover the seven tons per year given as the yield in the Snake River Canyon leads to the astonishing result of 2,310 tons of water per acre annually consumed, or about 27 inches, which is yet so far short of the six feet mentioned by Mr. Samuel Fortier, compiler of Bulletin 59, on the "water supply of Cache valley, Utah."

The difference suggests such an immense waste of water where that may be so truly called "the water of life" as to call for a wide range of experiment, both as to the requirement of plants and economical methods of furnishing what is necessary.

In connection with Mr. Dosh's brief description of orchards and farms of Snake river canyon, the cultivator ought to know as near as possible how much water he needs for each acre of apples, pears, peaches, prunes or other fruit crop; how much for his several field crops. These questions will not

only arise in limited localities, as between those who are drawing from the same ditch, but will arise between districts as to what proportion of a river, like the Snake river, shall be drawn out on the north side, at the American falls for instance, and what amount will be required or can be used on the south side. So, in such a situation as the Deschutes near Farewell bend, the whole flow of the river might be taken on to the desert, but on the west side the Tamilowa and Benton, or Squaw creek, can be used over much of that area, while the whole of the stream could be taken out on the east side and carried across Crooked river to fertilize a fine body of dry plain on the north side of that stream.

There certainly seems a wide field for intelligent enterprise.

JOHN MINTO,
Secretary State Board of Horticulture.

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